

MONTANA FISH AND GAME DEPARTMENT
FISHERIES DIVISION
HELENA, MONTANA

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State of Montana

Project No. F-7-R-12

Name Northwest Montana Fishery Study

Job No. III

Title Survey of Cutthroat and Dolly Varden
Trout in Flathead River and
Tributaries Above Flathead Lake

Period Covered: July 1, 1962 - June 30, 1963

Abstract: A crew of four men was employed to capture, tag and release Dolly Varden and cutthroat trout in the 171 miles of the Flathead River Drainage above Flathead Lake. Catch rate for tagged fish was 1.6 fish per hour per man (including float time). The average size of the cutthroat trout tagged averaged 9.0 inches, with a range from 7 to 16.5 inches. A total of 1,676 wild cutthroat trout and 297 Dolly Varden were tagged and released in the river system in 1961 and 1962.

Recapture information was received on 183 (10.9 percent) wild cutthroat trout, and 33 (11.1 percent) Dolly Varden. Planting tagged brood cutthroat trout in the Middle Fork of Flathead River yielded a 21.1% (103 of 487 fish tagged) return to anglers. Eighty percent of these fish were caught within three days after being planted. No fish were caught after two weeks.

Movement patterns were indicated, however, another summer's field work is necessary before the complete movements of the cutthroat trout in the Flathead River Drainage can be determined. Another summer's work would provide additional information on recaptures of tagged fish. Also information pertaining to water discharges and temperatures could be correlated to the movement patterns established.

Recommendations: It is recommended that the movement phase of the cutthroat trout and Dolly Varden in the Flathead River system be continued. This would result in more recaptures and facilitate correlation of water discharges and temperatures with fish movements.

Techniques Used: The collection of cutthroat trout in the Flathead River system above Flathead Lake has been a problem in the investigations of this species. Since 1950, conventional methods of capturing fish failed to achieve the desired number of cutthroat trout; the sampling procedure used in 1961 and 1962 provided more cutthroat than collected by other means. In these years four men floated, angled and tagged fish in the 171 miles of river system above Flathead Lake. Fish were tagged in the major tributaries as well as the main North and Middle Fork Rivers. Pack animals furnished the transportation in the areas inaccessible by vehicles.

All cutthroat trout and Dolly Varden collected that were over 7 inches (total length) were tagged with a plastic band around the mandible. Tricaine methanesulphonate (MS₂₂₂) was used as an anesthetic. The tagging information was recorded on a master tagging form and on individual (5" x 8") punch cards. Locations were designated by river section; tagging sections were approximately 2 miles long. Flathead Lake was divided into 12 tagging areas.

Findings:

Fish collection and tagging: The float crew made 33 individual trips on the rivers during the months of July, August and September 1962. These trips covered a sampling and tagging area of 171 river miles. Fourteen trips were made on the North Fork of the Flathead River, eight trips on the Middle Fork and eleven trips on the main Flathead River. Trip time ranged from 2 to 10 hours. The crew caught an average of 2.05 fish per hour per man (including float time) and tagged 1.61 fish per hour per man. A total of 1,329 cutthroat trout and Dolly Varden were caught, of which 78.5 percent were taggable (over 7 inches total length). The 1961 catch was 2.8 fish per hour per man and 1.8 tagged fish per hour. Fifty four percent of the trout collected were taggable size. Although angling technique was aimed toward cutthroat and Dolly Varden, other species were collected and released. These included mountain whitefish, kokanee, brook and rainbow trout.

The average size of cutthroat trout collected in the rivers were as follows:

	North Fork	Middle Fork	Flathead River
1961	8.4"	9.6"	8.8"
1962	8.5"	9.7"	9.8"

The average size of all cutthroat tagged in 1962 was 9.0 inches (same as in 1961) with a range from 7.0 to 16.5 inches.

In addition to the wild fishes tagged in the Flathead River system, in 1962, 487 hatchery brood west slope cutthroat trout were tagged and released at three locations on the Middle Fork of the Flathead River. The fish were four and five year old brood fish which ranged in size from 12 to 14 inches.

Total tagged fish in the river and lake system (including those tagged by sportsmen) are as follows:

	Year	Ct.	DV	Others ^{1/}	Total
North Fork	1961	411	18	0	429
	1962	595	6	5	606
Middle Fork	1961	239	3	1	243
	1962	157(487) ^{2/}	12	2	171 (487)
Flathead River	1961	94(216)	12	2	108 (216)
	1962	148	17	45	210
Flathead Lake	1961	20(195)	183	8	211 (195)
	1962	5	45	1	51
Swan River	1961	5	1	12	18
	1962	2	0	4	6
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	1961	769	217	23	1,009 (411)
	1962	907	80	57	1,044 (487)
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Grand Total		1,676	297	80	2,053 (898)
					<u>2,951</u>

^{1/} Rainbow, rainbow x cutthroat hybrids, brook trout and lake trout

^{2/} Figures in parentheses are cutthroat trout brood fish from the Libby Station, which were tagged and released

Returns:

Wild Cutthroat Trout: Tag return information depended on voluntary fisherman returns, catch data from the float crew, and creel checks made by wardens and personnel of the Fish and Wildlife Service operating on Flathead Lake. Newspaper articles and posters advertized and explained the tagging program to local sportsmen. In order to present a complete picture of fish movement in the river system, all tag returns received since the start of the tagging program in 1957, (Completion Reports, Job III F-7-R-10 and 11) are included in the present report.

One hundred and eighty three recaptures (10.9 percent of 1,676 tagged wild cutthroat trout in the Flathead River drainage) have been recorded. The breakdown of the tag recaptures are as follows:

	Available Tags	Tag Returns	Percent Return	Movement		
				Down Stream	Up Stream	Same Area
North Fork	1,006	94	9.4	62	11	21
Middle Fork	396	59	14.9	25	7	27
Flathead River	242	26	10.7	15	7	4
Flathead Lake	25	2	8.0	(Recaptured in lake)		
Swan River*	7	2	28.6	1	0	1
	<u>1,676</u>	<u>183</u>	<u>10.9</u>	<u>103</u>	<u>25</u>	<u>53</u>

*At the Swan River diversion dam

Seventy-six (73.7 percent) of the recaptured fish that showed downstream movement had traveled over 10 miles, whereas five (20.0 percent) of 25 upstream movements were over 10 miles. The up and downstream movements were as follows:

	Movements in Miles			
	Up 10	11-30	31-50	50-96
Downstream Movement	26	28	22	26
Upstream Movement	20	4	0	1

The time lapse between recaptures has ranged between 1 day and 25 months. After 25 months some fish were recaptured in the area where they were tagged and still other fish show movements of 40 miles downstream in less than one week. A breakdown of the recaptures as to length of time after tagging is as follows.

	Number of tagged fish recaptured		
	Caught the same year of tagging	Caught one year after tagging	Caught two years after tagging
North Fork	65	26	3
Middle Fork	41	16	2
Flathead River, Lake and Swan	20	10	0
	<u>126</u>	<u>52</u>	<u>5</u>

Total - 183

Hatchery Brood Cutthroat Trout:

Brood fish (excess) were separated and held in the Libby Rearing Station until all spawning activities were completed. A total of 489 fish were tagged and retained in the hatchery ponds for one week to observe delayed mortalities. Two fish died of undetermined causes during this waiting period. All the fish planted were males and three to four years old. They were transplanted into waters of the Middle Fork of the Flathead River on August 17th. The three areas of liberation (West Glacier, Nyack Flat and Walton Ranger Station) are all areas of fishermen concentration and are accessible by road. One hundred and three (21.1 percent) were taken by anglers. Eighty percent of the recaptures were caught within three days after liberation. No fish were reported recaptured after two weeks. Little movement either up or down stream was indicated from the recaptures - 83 percent were caught within 2 miles of the release points. Although the fish planted in the Middle Fork River were liberated close to Glacier National Park, where there are concentrations of non-resident fishermen, 59 percent of the recaptures were caught by Montana residents. A summary of the release

and recovery of hatchery brood fish in 1961 and 1962 is as follows:

	Total Released	Tags Recaptured	Percent Return	Mortality Observed*
1961	411	13	3.0	5
1962	487	103	20.5	3

*Mortalities observed after planting

Dolly Varden:

Although the emphasis of the tagging project was placed on the cutthroat trout, Dolly Varden were tagged when collected on the float trips. Also a special effort was made to capture and tag Dolly Varden during their spring concentrations in the lake. Eighty Dolly Varden were tagged during this report period and 25 were recaptured. Summarization of the Dolly Varden tagged and recaptured in the Flathead Drainage is as follows:

	Total Tagged	Recaptured
1961-2	217	8
1962-3	80	25
	<u>297</u>	<u>33</u>

Although Dolly Varden were tagged in both the river and lake, all recaptures were fish that were tagged in the lake. Two tagging projects were conducted on the Flathead River system prior to 1961. In 1953 and 1954^{1/}, a two-way weir was placed on the North Fork of the Flathead River at Trail Creek (105 miles above Flathead Lake); in 1957^{2/}, a two-way weir was placed at Bear Creek on the Middle Fork of the Flathead River (99 miles above Flathead Lake). A summary of these studies was as follows:

	Total Tagged	Total Returns	Percent Return
1953-54	198	29	14.7
1957	213	14	6.6
	<u>411</u>	<u>43</u>	

In all studies to date, movements have been recorded on 76 Dolly Varden. This is a 10.7 percent return of the fish tagged. In 1962-63,

^{1/}Block, Daniel G. 1955. Trout migration and spawning studies on the North Drainage of the Flathead River. Unpublished thesis, University of Montana.

^{2/}Johnson, Howard E. 1957. Survey of cutthroat trout fishery in the Flathead River and tributaries above Flathead Lake. Job Completion Report Fed. Aid in Fish Restoration Project Montana F-7-R-7, Job IV: pp multilithed.

9 of 33 returns left Flathead Lake and were recaptured upstream (maximum movement 120 miles). In 1952-54, 15 of 29 returns were caught in Flathead Lake (maximum downstream movement of 122 miles); in 1957, 4 of 14 returns were recaptured at the lake (maximum downstream movement 110 miles).

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